

Solubility handbook

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What is solubility

Solubility

Solubility is the property of a solid, liquid, or gaseous chemical substance called *solute* to dissolve in a solid, liquid, or gaseous solvent to form a homogeneous solution of the solute in the solvent. The solubility of a substance fundamentally depends on the used solvent as well as on temperature and pressure. The extent of the solubility of a substance in a specific solvent is measured as the saturation concentration where adding more solute does not increase the concentration of the solution.

Most often, the solvent is a liquid, which can be a pure substance or a mixture.^[1] One may also speak of solid solution, but rarely of solution in a gas (see vapor-liquid equilibrium instead).

The extent of solubility ranges widely, from infinitely soluble (fully miscible^[2]) such as ethanol in water, to poorly soluble, such as silver chloride in water. The term *insoluble* is often applied to poorly or very poorly soluble compounds.

Under certain conditions, the equilibrium solubility can be exceeded to give a so-called supersaturated solution, which is metastable.^[3]

Solubility is not to be confused with the ability to dissolve or liquefy a substance, because the solution might occur not only because of dissolution but also because of a chemical reaction. For example, zinc is insoluble in hydrochloric acid, but does dissolve in it by chemical reaction into zinc chloride and hydrogen, where zinc chloride is then soluble in hydrochloric acid. Solubility does not also depend on particle size or other kinetic factors; given enough time, even large particles will eventually dissolve.

IUPAC definition

According to an IUPAC definition^[4], solubility is the analytical composition of a saturated solution expressed as a proportion of a designated solute in a designated solvent. Solubility may be stated in units of concentration, molality, mole fraction, mole ratio, and other units.

Molecular view

Solubility occurs under dynamic equilibrium, which means that solubility results from the simultaneous and opposing processes of dissolution and phase joining (e.g., precipitation of solids). The solubility equilibrium occurs when the two processes proceed at a constant rate.

The term *solubility* is also used in some fields where the solute is altered by solvolysis. For example, many metals and their oxides are said to be "soluble in hydrochloric acid," whereas the aqueous acid degrades the solid to irreversibly give soluble products. It is also true that most ionic solids are degraded by polar solvents, but such processes are reversible. In those cases where the solute is not recovered upon evaporation of the solvent, the process is referred to as solvolysis. The thermodynamic concept of solubility does not apply straightforwardly to solvolysis.

When a solute dissolves, it may form several species in the solution. For example, an aqueous suspension of ferrous hydroxide, $\text{Fe}(\text{OH})_2$, will contain the series $[\text{Fe}(\text{H}_2\text{O})_{6-x}(\text{OH})_x]^{(2-x)+}$ as well as other oligomeric species. Furthermore, the solubility of ferrous hydroxide and the composition of its soluble components depends on pH. In general, solubility in the solvent phase can be given only for a specific solute that is thermodynamically stable, and the value of the solubility will include all the species in the solution (in the example above, all the iron-containing complexes).

Factors affecting solubility

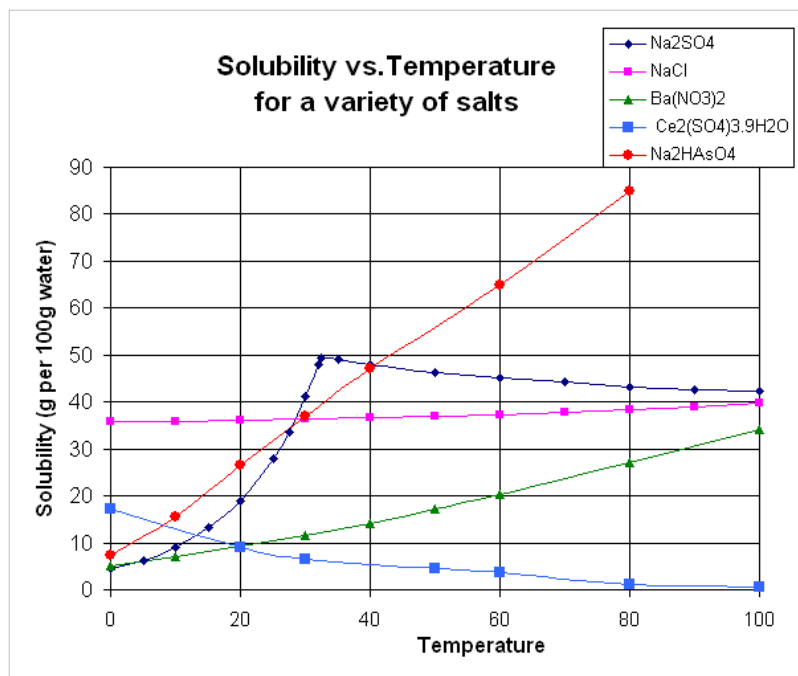
Solubility is defined for specific phases. For example, the solubility of aragonite and calcite in water are expected to differ, even though they are both polymorphs of calcium carbonate and have the same chemical formula.

The solubility of one substance in another is determined by the balance of intermolecular forces between the solvent and solute, and the entropy change that accompanies the solvation. Factors such as temperature and pressure will alter this balance, thus changing the solubility.

Solubility may also strongly depend on the presence of other species dissolved in the solvent, for example, complex-forming anions (ligands) in liquids. Solubility will also depend on the excess or deficiency of a common ion in the solution, a phenomenon known as the common-ion effect. To a lesser extent, solubility will depend on the ionic strength of solutions. The last two effects can be quantified using the equation for solubility equilibrium.

For a solid that dissolves in a redox reaction, solubility is expected to depend on the potential (within the range of potentials under which the solid remains the thermodynamically stable phase). For example, solubility of gold in high-temperature water is observed to be almost an order of magnitude higher when the redox potential is controlled using a highly oxidizing Fe_3O_4 - Fe_2O_3 redox buffer than with a moderately oxidizing Ni-NiO buffer.^[5]

Solubility (metastable) also depends on the physical size of the crystal or droplet of solute (or, strictly speaking, on the specific or molar surface area of the solute). For quantification, see the equation in the article on solubility equilibrium. For highly defective crystals, solubility may increase with the increasing degree of disorder. Both of these effects occur because of the dependence of solubility constant on the Gibbs energy of the crystal. The last two effects, although often difficult to measure, are of practical importance. For example, they provide the driving force for precipitate aging (the crystal size spontaneously increasing with time).



Temperature

The solubility of a given solute in a given solvent typically depends on temperature. For many solids dissolved in liquid water, the solubility increases with temperature up to 100 °C.^[6] In liquid water at high temperatures, (e.g., that approaching the critical temperature), the solubility of ionic solutes tends to decrease due to the change of properties and structure of liquid water; the lower dielectric constant results in a less polar solvent.

Gaseous solutes exhibit more complex behavior with temperature. As the temperature is raised, gases usually become less soluble in water (to minimum, which is below 120 °C for most permanent gases^[7]), but more soluble in organic solvents.^[6]

The chart shows solubility curves for some typical solid inorganic salts (temperature is in degrees Celsius).^[8] Many salts behave like barium nitrate and disodium hydrogen arsenate, and show a large increase in solubility with temperature. Some solutes (e.g., sodium chloride in water) exhibit solubility that is fairly independent of temperature. A few, such as cerium(III) sulfate, become less soluble in water as temperature increases. This

temperature dependence is sometimes referred to as "retrograde" or "inverse" solubility. Occasionally, a more complex pattern is observed, as with sodium sulfate, where the less soluble decahydrate crystal loses water of crystallization at 32 °C to form a more soluble anhydrous phase.

The solubility of organic compounds nearly always increases with temperature. The technique of recrystallization, used for purification of solids, depends on a solute's different solubilities in hot and cold solvent. A few exceptions exist, such as certain cyclodextrins.^[9]

Pressure

For condensed phases (solids and liquids), the pressure dependence of solubility is typically weak and usually neglected in practice. Assuming an ideal solution, the dependence can be quantified as:

$$\left(\frac{\partial \ln N_i}{\partial P}\right)_T = -\frac{V_{i,aq} - V_{i,cr}}{RT}$$

where the index i iterates the components, N_i is the mole fraction of the i^{th} component in the solution, P is the pressure, the index T refers to constant temperature, $V_{i,aq}$ is the partial molar volume of the i^{th} component in the solution, $V_{i,cr}$ is the partial molar volume of the i^{th} component in the dissolving solid, and R is the universal gas constant.^[10]

The pressure dependence of solubility does occasionally have practical significance. For example, precipitation fouling of oil fields and wells by calcium sulfate (which decreases its solubility with decreasing pressure) can result in decreased productivity with time.

Solubility of gases

Henry's law is used to quantify the solubility of gases in solvents. The solubility of a gas in a solvent is directly proportional to the partial pressure of that gas above the solvent. This relationship is written as:

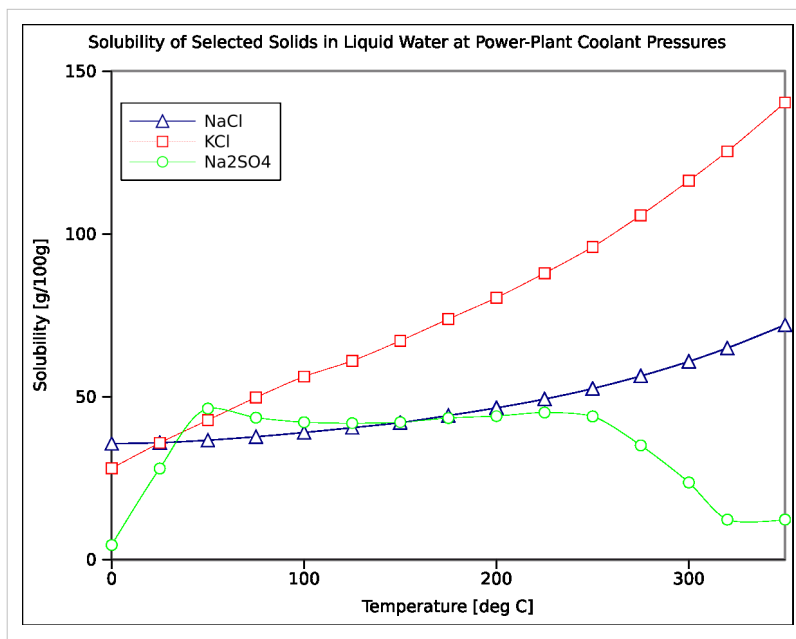
$$p = k_H c$$

where k_H is a temperature-dependent constant (for example, 769.2 L·atm/mol for dioxygen (O₂) in water at 298 K), p is the partial pressure (atm), and c is the concentration of the dissolved gas in the liquid (mol/L).

The solubility of gases is sometimes also quantified using Bunsen solubility coefficient.

In the presence of small bubbles, the solubility of the gas does not depend on the bubble radius in any other way than through the effect of the radius on pressure (i.e., the solubility of gas in the liquid in contact with small bubbles is increased due to pressure increase by $\Delta p = 2\gamma/r$; see Young–Laplace equation).^[11]

Henry's law is valid for gases that do not undergo speciation on dissolution. Sieverts' law shows a case when this assumption does not hold.



Polarity

A popular aphorism used for predicting solubility is "*like dissolves like*".^[12] This statement indicates that a solute will dissolve best in a solvent that has a similar chemical structure to itself. This view is simplistic, but it is a useful rule of thumb. The overall solvation capacity of a solvent depends primarily on its polarity.^[13] For example, a very polar (hydrophilic) solute such as urea is very soluble in highly polar water, less soluble in fairly polar methanol, and practically insoluble in non-polar solvents such as benzene. In contrast, a non-polar or lipophilic solute such as naphthalene is insoluble in water, fairly soluble in methanol, and highly soluble in non-polar benzene.^[14]

The solubility is favored by entropy of mixing and depends on enthalpy of dissolution and the hydrophobic effect.

Synthetic chemists often exploit differences in solubilities to separate and purify compounds from reaction mixtures, using the technique of liquid-liquid extraction.

Rate of dissolution

Dissolution is not always an instantaneous process. It is fast when salt and sugar dissolve in water but much slower for a tablet of aspirin or a large crystal of hydrated copper(II) sulfate. These observations are the consequence of two factors: the rate of solubilization (in kg/s) is related to the solubility product and the surface area of the material. The speed at which a solid dissolves may depend on its crystallinity or lack thereof in the case of amorphous solids and the surface area (crystallite size) and the presence of polymorphism. Many practical systems illustrate this effect, for example in designing methods for controlled drug delivery. Critically, the dissolution rate may depend on the presence of mixing and other factors that determine the degree of undersaturation in the liquid solvent film immediately adjacent to the solid solute crystal. In some cases, solubility equilibria can take a long time to establish (hours, days, months, or many years; depending on the nature of the solute and other factors). In practice, it means that the amount of solute in a solution is not always determined by its thermodynamic solubility, but may depend on kinetics of dissolution (or precipitation).

The rate of dissolution and solubility should not be confused as they are different concepts, kinetic and thermodynamic, respectively. The solubilization kinetics, as well as apparent solubility can be improved after complexation of an active ingredient with cyclodextrin. This can be used in the case of drug with poor solubility.^[15]

Quantification of solubility

Solubility is commonly expressed as a concentration, either by mass (g of solute per kg of solvent, g per dL (100mL) of solvent, molarity, molality, mole fraction, or other similar descriptions of concentration. The maximum equilibrium amount of solute that can dissolve per amount of solvent is the solubility of that solute in that solvent under the specified conditions. The advantage of expressing solubility in this manner is its simplicity, while the disadvantage is that it can strongly depend on the presence of other species in the solvent (for example, the common ion effect).

Solubility constants are used to describe saturated solutions of ionic compounds of relatively low solubility (see solubility equilibrium). The solubility constant is a special case of an equilibrium constant. It describes the balance between dissolved ions from the salt and undissolved salt. The solubility constant is also "applicable" (i.e., useful) to precipitation, the reverse of the dissolving reaction. As with other equilibrium constants, temperature can affect the numerical value of solubility constant. The solubility constant is not as simple as solubility, however the value of this constant is generally independent of the presence of other species in the solvent.

The Flory-Huggins solution theory is a theoretical model describing the solubility of polymers. The Hansen Solubility Parameters and the Hildebrand solubility parameters are empirical methods for the prediction of solubility. It is also possible to predict solubility from other physical constants such as the enthalpy of fusion.

The partition coefficient (Log P) is a measure of differential solubility of a compound in a hydrophobic solvent (octanol) and a hydrophilic solvent (water). The logarithm of these two values enables compounds to be ranked in

terms of hydrophilicity (or hydrophobicity).

The energy change associated with dissolving is usually given per mole of solute as the enthalpy of solution.

Applications

Solubility is of fundamental importance in a large number of scientific disciplines and practical applications, ranging from ore processing, to the use of medicines, and the transport of pollutants.

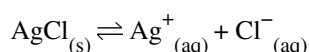
Solubility is often said to be one of the "characteristic properties of a substance," which means that solubility is commonly used to describe the substance, to indicate a substance's polarity, to help to distinguish it from other substances, and as a guide to applications of the substance. For example, indigo is described as "insoluble in water, alcohol, or ether but soluble in chloroform, nitrobenzene, or concentrated sulfuric acid".

Solubility of a substance is useful when separating mixtures. For example, a mixture of salt (sodium chloride) and silica may be separated by dissolving the salt in water, and filtering off the undissolved silica. The synthesis of chemical compounds, by the milligram in a laboratory, or by the ton in industry, both make use of the relative solubilities of the desired product, as well as unreacted starting materials, byproducts, and side products to achieve separation.

Another example of this is the synthesis of benzoic acid from phenylmagnesium bromide and dry ice. Benzoic acid is more soluble in an organic solvent such as dichloromethane or diethyl ether, and when shaken with this organic solvent in a separatory funnel, will preferentially dissolve in the organic layer. The other reaction products, including the magnesium bromide, will remain in the aqueous layer, clearly showing that separation based on solubility is achieved. This process, known as liquid-liquid extraction, is an important technique in synthetic chemistry.

Solubility of ionic compounds in water

Some ionic compounds (salts) dissolve in water, which arises because of the attraction between positive and negative charges (see: solvation). For example, the salt's positive ions (e.g. Ag^+) attract the partially negative oxygens in H_2O . Likewise, the salt's negative ions (e.g. Cl^-) attract the partially positive hydrogens in H_2O . Note: oxygen is partially negative because it is more electronegative than hydrogen, and vice-versa (see: chemical polarity).



However, there is a limit to how much salt can be dissolved in a given volume of water. This amount is given by the solubility product, K_{sp} . This value depends on the type of salt (AgCl vs. NaCl , for example), temperature, and the common ion effect.

One can calculate the amount of AgCl that will dissolve in 1 liter of water, some algebra is required.

$$K_{sp} = [\text{Ag}^+] \times [\text{Cl}^-] \text{ (definition of solubility product)}$$

$$K_{sp} = 1.8 \times 10^{-10} \text{ (from a table of solubility products)}$$

$[\text{Ag}^+] = [\text{Cl}^-]$, in the absence of other silver or chloride salts,

$$[\text{Ag}^+]^2 = 1.8 \times 10^{-10}$$

$$[\text{Ag}^+] = 1.34 \times 10^{-5}$$

The result: 1 liter of water can dissolve 1.34×10^{-5} moles of $\text{AgCl}_{(s)}$ at room temperature. Compared with other types of salts, AgCl is poorly soluble in water. In contrast, table salt (NaCl) has a higher K_{sp} and is, therefore, more soluble.

Soluble	Insoluble
Group I and NH_4^+ compounds	Carbonates (Except Group I, NH_4^+ and uranyl compounds)
Nitrates	Sulfites (Except Group I and NH_4^+ compounds)
Acetates (Ethanoates) (Except Ag^+ compounds)	Phosphates (Except Group I and NH_4^+ compounds)
Chlorides (Chlorates and Perchlorates), bromides and iodides (Except Ag^+ , Pb^{2+} , Cu^+ and Hg_2^{2+})	Hydroxides and oxides (Except Group I, NH_4^+ , Ba^{2+} , Sr^{2+} and Tl^+)
Sulfates (Except Ag^+ , Pb^{2+} , Ba^{2+} , Sr^{2+} and Ca^{2+})	Sulfides (Except Group I, Group II and NH_4^+ compounds)

Solubility of organic compounds

The principle outlined above under polarity, that *like dissolves like*, is the usual guide to solubility with organic systems. For example, petroleum jelly will dissolve in gasoline because both petroleum jelly and gasoline are non-polar hydrocarbons. It will not, on the other hand, dissolve in ethyl alcohol or water, since the polarity of these solvents is too high. Sugar will not dissolve in gasoline, since sugar is too polar in comparison with gasoline. A mixture of gasoline and sugar can therefore be separated by filtration, or extraction with water.

Solubility in non-aqueous solvents

Most publicly available solubility values are those for solubility in water.^[16] The reference also lists some for non-aqueous solvents. Solubility data for non-aqueous solvents is currently being collected via an open notebook science crowdsourcing project.^{[17][18]}

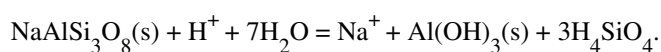
Solid solution

This term is often used in the field of metallurgy to refer to the extent that an alloying element will dissolve into the base metal without forming a separate phase. The solubility line (or curve) is the line (or lines) on a phase diagram that give the limits of solute addition. That is, the lines show the maximum amount of a component that can be added to another component and still be in solid solution. In the solid's crystalline structure, the 'solute' element can either take the place of the matrix within the lattice (a substitutional position, for example: chromium in iron) or take a place in a space between the lattice points (an interstitial position, for example: carbon in iron).

In microelectronic fabrication, solid solubility refers to the maximum concentration of impurities one can place into the substrate.

Incongruent dissolution

Many substances dissolve congruently; i.e., the composition of the solid and the dissolved solute stoichiometrically match. However, some substances may dissolve incongruently, whereby the composition of the solute in solution does not match that of the solid. This solubilization is accompanied by alteration of the "primary solid" and possibly formation of a secondary solid phase. However, in general, some primary solid also remains and a complex solubility equilibrium establishes. For example, dissolution of albite may result in formation of gibbsite.^[19]



In this case, the solubility of albite is expected to depend on the solid-to-solvent ratio. This kind of solubility is of great importance in geology, where it results in formation of metamorphic rocks.

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lxsrv7.oru.edu/~alang/onsc/solubility/allsolvents.php?solute=vanillin.
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External links

- VCClab.org (<http://www.vcclab.org/lab/alogps>), "ALOGPS" free interactive calculation of aqueous solubility of compounds at Virtual Computational Chemistry Laboratory using several algorithms.
- ACDlabs.com (http://www.acdlabs.com/products/phys_chem_lab/aqsol/)? ACD/Solubility DB aqueous solubility prediction
- Simulations-plus.com (<http://www.simulations-plus.com/Definitions.aspx?IID=58&pID=13>), S+S_w, an aqueous solubility prediction model.

Solubility chart

Solubility chart

A **solubility chart** refers to a chart with a list of ions and how, when mixed with other ions, they can become precipitates or remain aqueous. The following chart shows the solubilities of various compounds at a pressure of 1 atm and at room temperature (approx. 293.15 K). Any box that reads "soluble" results in an aqueous product, while "slightly soluble" and "insoluble" markings means that there is a precipitate that will form (usually, this is a solid). Boxes marked "other" can mean that many different states of products can result. For more detailed information of the exact solubility of the compounds, see the solubility table.

	Bromide Br ⁻	Carbonate CO ₃ ²⁻	Chloride Cl ⁻	Chlorates ClO ₃ ⁻	Hydroxide OH ⁻	Nitrate NO ₃ ⁻	Oxide O ²⁻	Phosphate PO ₄ ³⁻	Sulfate SO ₄ ²⁻	Dichromate Cr ₂ O ₇ ²⁻
Aluminium Al ³⁺	S	X	S	S	I	S	I	I	S	I
Ammonium NH ₄ ⁺	S	S	S	S	S	S	X	S	S	S
Calcium Ca ²⁺	S	I	S	S	sS	S	sS	I	sS	I
Copper(II) Cu ²⁺	S	I	S	S	I	S	I	I	S	I
Iron(II) Fe ²⁺	S	I	S	S	I	S	I	I	S	I
Iron(III) Fe ³⁺	S	X	S	S	I	S	I	I	sS	I
Magnesium Mg ²⁺	S	I	S	S	I	S	I	I	S	I
Potassium K ⁺	S	S	S	S	S	S	S	S	S	S
Silver Ag ⁺	I	I	I	S	X	S	I	I	sS	I
Sodium Na ⁺	S	S	S	S	S	S	S	S	S	S
Zinc Zn ²⁺	S	I	S	S	I	S	I	I	S	I
	Bromide Br ⁻	Carbonate CO ₃ ²⁻	Chloride Cl ⁻	Chlorates ClO ₃ ⁻	Hydroxide OH ⁻	Nitrate NO ₃ ⁻	Oxide O ²⁻	Phosphate PO ₄ ³⁻	Sulfate SO ₄ ²⁻	Dichromate Cr ₂ O ₇ ²⁻

Key:

S	soluble
I	insoluble
sS	slightly soluble
X	other

External links

- Additional Ionic Combinations ^[1]

References

[1] http://community.aaps.k12.mi.us/mouradia/Solubility_Chart.html

Solubility table

Solubility table

The table below provides information on the variation of solubility of different substances (mostly inorganic compounds) in water with temperature, under 1 atm pressure, units of solubility in g/100g H₂O. The substances are listed in alphabetical order.

Contents

A

Substance	Formula	0°C	10°C	15°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°	100°C
Actinium(III) hydroxide	Ac(OH) ₃				0.0021								
Aluminium chloride	AlCl ₃	43.9	44.9		45.8	46.6	47.3		48.1		48.6		49.0
Aluminium fluoride	AlF ₃	0.56	0.56		0.67	0.78	0.91		1.1		1.32		1.72
Aluminium hydroxide	Al(OH) ₃				0.0001								
Aluminium nitrate	Al(NO ₃) ₃	60	66.7		73.9	81.8	88.7	96.0	106	120	132	153	160
Aluminium perchlorate	Al(ClO ₄) ₃	122	128		133								
Aluminium sulfate	Al ₂ (SO ₄) ₃	31.2	33.5		36.4	40.4	45.8	52.2	59.2	66.2	73	80.8	89.0
Ammonia (Unit:mL/mL)	NH ₃	1176	900		702	565	428	333	252	188	138	100	88
Ammonium azide	NH ₄ N ₃	16			25.3		37.1						
Ammonium benzoate	NH ₄ C ₇ H ₅ O ₂		19.6		21.3								83
Ammonium bicarbonate	NH ₄ HCO ₃	11.9	16.1		21.7	28.4	36.6		59.2		109	dec	
Ammonium bromide	NH ₄ Br	60.6	68.1		76.4	83.2	91.2	99.2	108	117	125	135	145
Ammonium carbonate	(NH ₄) ₂ CO ₃ ·H ₂ O	55.8			100				dec				
Ammonium chlorate	NH ₄ ClO ₃				28.7								
Ammonium chloride	NH ₄ Cl	29.4	33.2		37.2	41.4	45.8	50.4	55.3	60.2	65.6	71.2	77.3
Ammonium hexachloroplatinate	(NH ₄) ₂ PtCl ₆	0.289	0.374		0.499	0.637	0.815		1.44		2.16	2.61	3.36
Ammonium chromate	(NH ₄) ₂ CrO ₄	25	29.2		34	39.3	45.3	51.9	59.0	71.2	76.1		
Ammonium dichromate	(NH ₄) ₂ Cr ₂ O ₇	18.2	25.5		35.6	46.5	58.5	71.4	86.0		115		156
Ammonium dihydrogen arsenate	NH ₄ H ₂ AsO ₄	33.7			48.7		63.8		83		107	122	
Ammonium dihydrogen phosphate	NH ₄ H ₂ PO ₄	22.7	39.5		37.4	46.4	56.7	69.0	82.5	98.6	118.3	142.8	173.2
Ammonium fluoride	NH ₄ F	100											
Ammonium fluorosilicate	(NH ₄) ₂ SiF ₆	12.28	16.41		18.6	25.0	31.6	35.4	40.4	44.9	75°C:48.1		61.0
Ammonium formate	NH ₄ HCO ₂	102			143		204		311		533		

B

Substance	Formula	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°	100°C
Barium acetate	Ba(C ₂ H ₃ O ₂) ₂	58.8	62	72	75	78.5	77	75	74	74		
Barium arsenate	Ba ₃ (AsO ₄) ₂			2.586E-09								
Barium azide	Ba(N ₃) ₂	12.5	16.1	17.4					24.75			
Barium bromate monohydrate	Ba(BrO ₃) ₂ ·H ₂ O	0.29	0.44	0.65	0.95	1.31	1.75	2.27	3.01	3.65	4.45	5.71
Barium bromide	BaBr ₂	98	101	104	109	114		123		135		149
Barium carbonate	BaCO ₃			0.001409								
Barium chlorate	Ba(ClO ₃) ₂	20.3	26.9	33.9	41.6	49.7		66.7		84.8		105
Barium chloride	BaCl ₂	31.2	33.5	35.8	38.1	40.8		46.2		52.5	55.8	59.4
Barium chlorite	Ba(ClO ₂) ₂	43.9	44.6	45.4		47.9		53.8		66.6		80.8
Barium chromate	BaCrO ₄			0.0002775								
Barium cyanide	Ba(CN) ₂			80								
Barium ferrocyanide	Ba ₂ Fe(CN) ₆			0.009732								
Barium fluoride	BaF ₂		0.159	0.16	0.161							
Barium fluorosilicate	BaSiF ₆			0.028								
Barium formate	Ba(HCO ₂) ₂	26.2	28	31.9	34		38.6		44.2	47.6	51.3	
Barium hydrogen phosphate	BaHPO ₄			0.013								
Barium hydrogen phosphite	BaHPO ₃			0.687								
Barium hydroxide	Ba(OH) ₂ ·8H ₂ O	1.67	2.48	3.89	5.59	8.22	11.7	20.9		101		
Barium iodate	Ba(IO ₃) ₂			0.035	0.046	0.057						0.2
Barium iodide	BaI ₂	182	201	223	250			264			291	301
Barium molybdate	BaMoO ₄			0.006								
Barium nitrate	Ba(NO ₃) ₂	4.95	6.77	9.02	11.5	14.1		20.4		27.2		34.4
Barium nitrite	Ba(NO ₂) ₂	50.3	60	72.8		102		151		222	261	325

Caesium acetate	$\text{CsC}_2\text{H}_3\text{O}_2$			1010								
Caesium azide	CsN_3			307								
Caesium bromate	CsBrO_3	0.21		3.66	4.53	5.3						
Caesium bromide	CsBr			108								
Caesium chlorate	CsClO_3		3.8	6.2	9.5	13.8		26.2		45	58	79
Caesium chloride	CsCl	146	175	187	197	208		230		250	260	271
Caesium chromate	Cs_2CrO_4		71.4									
Caesium fluoride	CsF			322								
Caesium fluoroborate	CsBF_4			0.818								
Caesium formate	CsHCO_2	335	381	450	694							
Caesium iodate	CsIO_3			2.6								
Caesium iodide	CsI	44.1	58.5	76.5	96	124		150		190	205	
Caesium nitrate	CsNO_3	9.33	14.9	23	33.9	47.2		83.8		134	163	197
Caesium oxalate	$\text{Cs}_2\text{C}_2\text{O}_4$			313								
Caesium perchlorate	CsClO_4	0.8	1	1.6	2.6	4		7.3		14.4	20.5	30
Caesium permanganate	CsMnO_4			0.228								
Caesium selenate	Cs_2SeO_4		244									
Caesium sulfate	Cs_2SO_4	167	173	179	184	190		200		210	215	200
Calcium acetate	$\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$	37.4	36	34.7	33.8	33.2		32.7		33.5	31.1	29.7
Calcium arsenate	$\text{Ca}_3(\text{AsO}_4)_2$			0.003629								
Calcium azide	$\text{Ca}(\text{N}_3)_2$			45								
Calcium benzoate	$\text{Ca}(\text{C}_7\text{H}_5\text{O}_2)_2 \cdot 3\text{H}_2\text{O}$	2.32	2.45	2.72	3.02	3.42		4.71		6.87	8.55	8.7
Calcium bicarbonate	$\text{Ca}(\text{HCO}_3)_2$	16.1		16.6		17.1		17.5		17.9		18.4

Calcium bromate	$\text{Ca}(\text{BrO}_3)_2$			230							
Calcium bromide	CaBr_2	125	132	143		213		278		295	312
Calcium carbonate (Aragonite)	CaCO_3 -Aragonite			0.0007753							
Calcium carbonate (Calcite)	CaCO_3 -Calcite			0.0006170							
Calcium chlorate	$\text{Ca}(\text{ClO}_3)_2$			209							
Calcium chloride	CaCl_2	59.5	64.7	74.5	100	128		137		147	154 159
Calcium chromate	CaCrO_4	4.5		2.25	1.83	1.49		0.83			
Monocalcium phosphate	$\text{Ca}(\text{H}_2\text{PO}_4)_2$			1.8							
Calcium fluoride	CaF_2	0.008575									
Calcium fluorosilicate	CaSiF_6			0.518							
Calcium formate	$\text{Ca}(\text{HCO}_2)_2$	16.1		16.6		17.1		17.5		17.9	18.4
Dicalcium phosphate	CaHPO_4			0.004303							
Calcium hydroxide	$\text{Ca}(\text{OH})_2$	0.189	0.182	0.173	0.16	0.141		0.121		0.086	0.076
Calcium iodate	$\text{Ca}(\text{IO}_3)_2$	0.09		0.24	0.38	0.52		0.65		0.66	0.67 0.67
Calcium iodide	CaI_2	64.6		66	67.6	70.8		74		78	81
Calcium molybdate	CaMoO_4			0.004099							
Calcium nitrate	$\text{Ca}(\text{NO}_3)_2$			121.2							
Calcium nitrate tetrahydrate	$\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$	102	115	129	152	191				358	363
Calcium nitrite	$\text{Ca}(\text{NO}_2)_2 \cdot 4\text{H}_2\text{O}$	63.9		84.5	104			134		151	166 178
Calcium oxalate	CaC_2O_4			0.00067							0.0014
Calcium perchlorate	$\text{Ca}(\text{ClO}_4)_2$			188							
Calcium permanganate	$\text{Ca}(\text{MnO}_4)_2$			338							

Calcium phosphate	$\text{Ca}_3(\text{PO}_4)_2$			0.002								
Calcium selenate	$\text{CaSeO}_4 \cdot 2\text{H}_2\text{O}$	9.73	9.77	9.22	8.79	7.14						
Calcium sulfate	$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	0.223	0.244	0.255	0.264	0.265		0.244		0.234		0.205
Calcium tungstate	CaWO_4			0.002387								
Carbon dioxide	CO_2			0.1782								
Carbon monoxide	CO			0.0026								
Cerium(III) acetate	$\text{Ce}(\text{C}_2\text{H}_3\text{O}_2)_3$			0.35								
Cerium(III) chloride	CeCl_3			100								
Cerium(III) hydroxide	$\text{Ce}(\text{OH})_3$			0.0000943								
Cerium(III) iodate	$\text{Ce}(\text{IO}_3)_3$			0.123								
Cerium(III) nitrate	$\text{Ce}(\text{NO}_3)_3$			234								
Cerium(III) phosphate	CePO_4			7.434E-11								
Cerium(III) selenate	$\text{Ce}_2(\text{SeO}_4)_3$	39.5	37.2	35.2	33.2	32.6		13.7		4.6		
Cerium(III) sulfate	$\text{Ce}_2(\text{SO}_4)_3 \cdot 2\text{H}_2\text{O}$	21.4		9.84	7.24	5.63		3.87				
Cerium(IV) hydroxide	$\text{Ce}(\text{OH})_4$			1.981E-09								
Chromium(III) nitrate	$\text{Cr}(\text{NO}_3)_3$	108	124	130	152							
Chromium(III) perchlorate	$\text{Cr}(\text{ClO}_4)_3$	104	123	130								
Chromium(III) sulfate	$\text{Cr}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$			220								
Chromium(VI) oxide	CrO_3	61.7		63							67	
Cobalt(II) bromate	$\text{Co}(\text{BrO}_3)_2 \cdot 6\text{H}_2\text{O}$			45.5								
Cobalt(II) bromide	CoBr_2	91.9		112	128	163		227		241		257
Cobalt(II) chlorate	$\text{Co}(\text{ClO}_3)_2$	135	162	180	195	214		316				
Cobalt(II) chloride	CoCl_2	43.5	47.7	52.9	59.7	69.5		93.8		97.6	101	106

Cobalt(II) fluoride	CoF ₂			1.36							
Cobalt(II) fluorosilicate	CoSiF ₆ ·6H ₂ O			118							
Cobalt(II) iodate	Co(IO ₃) ₂ ·2H ₂ O			1.02	0.9	0.88		0.82		0.73	0.7
Cobalt(II) iodide	CoI ₂			203							
Cobalt(II) nitrate	Co(NO ₃) ₂	84	89.6	97.4	111	125		174		204	300
Cobalt(II) nitrite	Co(NO ₂) ₂	0.076	0.24	0.4	0.61	0.85					
Cobalt oxalate	CoC ₂ O ₄ ·2H ₂ O			2.6972E-9							
Cobalt(II) perchlorate	Co(ClO ₄) ₂			104							
Cobalt(II) sulfate	CoSO ₄	25.5	30.5	36.1	42	48.8		55		53.8	45.3
Copper(I) chloride	CuCl			0.0099							
Copper(I) cyanide	CuCN			1.602E-09							
Copper(I) hydroxide	CuOH			8.055E-07							
Copper(I) iodide	CuI			0.00001997							
Copper(I) sulfide	Cu ₂ S			1.361E-15							
Copper(I) thiocyanate	CuSCN			8.427E-07							
Copper(II) bromide	CuBr ₂	107	116	126	128	131					
Copper(II) carbonate	CuCO ₃			0.0001462							
Copper(II) chlorate	Cu(ClO ₃) ₂			242							
Copper(II) chloride	CuCl ₂	68.6	70.9	73	77.3	87.6		96.5		104	108
Copper(II) chromate	CuCrO ₄			0.03407							
Copper(II) fluoride	CuF ₂			0.075							
Copper(II) fluorosilicate	CuSiF ₆	73.5	76.5	81.6	84.1	91.2				93.2	
Copper(II) formate	Cu(HCO ₂) ₂			12.5							

I

Substance	Formula	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°	100°C
Indium(III) bromide	InBr ₃			571								
Indium(III) chloride	InCl ₃		210	212								
Indium(III) fluoride	InF ₃			11.2								
Indium(III) hydroxide	In(OH) ₃			3.645E-08								
Indium(III) iodate	In(IO ₃) ₃			0.067								
Indium(III) sulfide	In ₂ S ₃			2.867E-14								
Iron(II) bromide	FeBr ₂	101	109	117	124	133		144		168	176	184
Iron(II) carbonate	FeCO ₃			0.00006554								
Iron(II) chloride	FeCl ₂	49.7	59	62.5	66.7	70		78.3		88.7	92.3	94.9
Iron(II) fluorosilicate	FeSiF ₆ ·6H ₂ O	72.1	74.4		77			84		88		100
Iron(II) hydroxide	Fe(OH) ₂			0.00005255								
Iron(II) nitrate	Fe(NO ₃) ₂ ·6H ₂ O	113	134									
Iron(II) oxalate	FeC ₂ O ₄ ·2H ₂ O			0.008								
Iron(II) perchlorate	Fe(ClO ₄) ₂ ·6H ₂ O			299								
Iron(II) sulfate	FeSO ₄ ·7H ₂ O			28.8		40	48	60	73.3		101	79.9
Iron(III) arsenate	FeAsO ₄			1.47E-09								
Iron(III) chloride	FeCl ₃ ·6H ₂ O	74.4		91.8	107							
Iron(III) fluoride	FeF ₃			0.091								
Iron(III) hydroxide	Fe(OH) ₃			2.097E-09								
Iron(III) iodate	Fe(IO ₃) ₃			0.36								
Iron(III) nitrate	Fe(NO ₃) ₃ ·9H ₂ O	112		138		175						
Iron(III) perchlorate	Fe(ClO ₄) ₃	289		368	422	478		772				
Iron(III) sulfate	Fe ₂ (SO ₄) ₃ ·9H ₂ O			440								

L

Lead(II) iodate	$\text{Pb}(\text{IO}_3)_2$			0.0024							
Lead(II) iodide	PbI_2	0.044	0.056	0.069	0.09	0.124		0.193		0.294	0.42
Lead(II) molybdate	PbMoO_4			0.00001161							
Lead(II) nitrate	$\text{Pb}(\text{NO}_3)_2$	37.5	46.2	54.3	63.4	72.1		91.6		111	133
Lead(II) oxalate	PbC_2O_4			0.0006495							
Lead(II) perchlorate	$\text{Pb}(\text{ClO}_4)_2 \cdot 3\text{H}_2\text{O}$			440							
Lead(II) selenate	PbSeO_4			0.0131							
Lead(II) sulfate	PbSO_4			0.003836							
Lead(II) sulfide	PbS			6.767E-13							
Lead(II) tartrate	$\text{PbC}_4\text{H}_4\text{O}_6$			0.0025							
Lead(II) thiocyanate	$\text{Pb}(\text{SCN})_2$			0.553							
Lead(II) thiosulfate	PbS_2O_3			0.0202							
Lead(II) tungstate	PbWO_4			0.02838							
Lead(IV) hydroxide	$\text{Pb}(\text{OH})_4$			7.229E-11							
Lithium acetate	$\text{LiC}_2\text{H}_3\text{O}_2$	31.2	35.1	40.8	50.6	68.6					
Lithium azide	LiN_3	61.3	64.2	67.2	71.2	75.4		86.6			100
Lithium benzoate	$\text{LiC}_7\text{H}_5\text{O}_2$	38.9	41.6	44.7	53.8						
Lithium bicarbonate	LiHCO_3			5.74							
Lithium bromate	LiBrO_3	154	166	179	198	221		269		308	329 355
Lithium bromide	LiBr	143	147	160	183	211		223		245	266
Lithium carbonate	Li_2CO_3	1.54	1.43	1.33	1.26	1.17		1.01		0.85	0.72
Lithium chlorate	LiClO_3	241	283	372	488	604		777			
Lithium chloride	LiCl	69.2	74.5	83.5	86.2	89.8		98.4		112	121 128
Lithium chromate	$\text{Li}_2\text{CrO}_4 \cdot 2\text{H}_2\text{O}$			142							

M

Substance	Formula	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°	100°C
Magnesium acetate	$\text{Mg}(\text{C}_2\text{H}_3\text{O}_2)_2$	56.7	59.7	53.4	68.6	75.7		118				
Magnesium benzoate	$\text{Mg}(\text{C}_7\text{H}_5\text{O}_2)_2 \cdot \text{H}_2\text{O}$					5						
Magnesium bromate	$\text{Mg}(\text{BrO}_3)_2 \cdot 6\text{H}_2\text{O}$					58						
Magnesium bromide	MgBr_2	98	99	101	104	106		112				125
Magnesium carbonate	MgCO_3			0.039								
Magnesium chlorate	$\text{Mg}(\text{ClO}_3)_2$	114	123	135	155	178		242			268	
Magnesium chloride	MgCl_2	52.9	53.6	54.6	55.8	57.5		61		66.1	69.5	73.3
Magnesium chromate	$\text{MgCrO}_4 \cdot 7\text{H}_2\text{O}$			137								
Magnesium fluoride	MgF_2			0.007325								
Magnesium fluorosilicate	MgSiF_6	26.3		30.8		34.9		44.4				
Magnesium formate	$\text{Mg}(\text{HCO}_2)_2$	14	14.2	14.4	14.9	15.9		17.9		20.5	22.2	22.9
Magnesium hydroxide	$\text{Mg}(\text{OH})_2$			0.0009628								
Magnesium iodate	$\text{Mg}(\text{IO}_3)_2$		7.2	8.6	10	11.7		15.2		15.5	15.6	
Magnesium iodide	MgI_2	120		140		173				186		
Magnesium molybdate	MgMoO_4			13.7								
Magnesium nitrate	$\text{Mg}(\text{NO}_3)_2$	62.1	66	69.5	73.6	78.9		78.9		91.6	106	
Magnesium oxalate	MgC_2O_4			0.104								
Magnesium perchlorate	$\text{Mg}(\text{ClO}_4)_2$			49.6								
Magnesium phosphate	$\text{Mg}_3(\text{PO}_4)_2$			0.0002588								
Magnesium selenate	MgSeO_4	20	30.4	38.3	44.3	48.6		55.8				
Magnesium selenite	MgSeO_3			0.05454								
Magnesium sulfate	MgSO_4	22	28.2	33.7	38.9	44.5		54.6		55.8	52.9	50.4

Magnesium thiosulfate	MgS_2O_3			50							
Maltose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$			108							
D-Mannose	$\text{C}_6\text{H}_{12}\text{O}_6$			248							
Manganese(II) bromide	MnBr_2	127	136	147	157	169		197		225	226 228
Manganese(II) carbonate	MnCO_3			0.00004877							
Manganese(II) chloride	MnCl_2	63.4	68.1	73.9	80.8	88.5		109		113	114 115
Manganese(II) ferrocyanide	$\text{Mn}_2\text{Fe}(\text{CN})_6$			0.001882							
Manganese(II) fluoride	MnF_2			10.6		0.67		0.44			0.48
Manganese(II) fluorosilicate	$\text{MnSiF}_6 \cdot 6\text{H}_2\text{O}$			140							
Manganese(II) hydroxide	$\text{Mn}(\text{OH})_2$			0.0003221							
Manganese(II) nitrate	$\text{Mn}(\text{NO}_3)_2$	102	118	139	206						
Manganese(II) oxalate	$\text{MnC}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$	0.02	0.024	0.028	0.033						
Manganese(II) sulfate	MnSO_4	52.9	59.7	62.9	62.9	60		53.6		45.6	40.9 35.3
Mercury(I) azide	$\text{Hg}_2(\text{N}_3)_2$			0.02727							
Mercury(I) bromide	Hg_2Br_2			0.000001352							
Mercury(I) carbonate	Hg_2CO_3			4.351E-07							
Mercury(I) chloride	Hg_2Cl_2			0.00003246							
Mercury(I) chromate	Hg_2CrO_4			0.002313							
Mercury(I) cyanide	$\text{Hg}_2(\text{CN})_2$			2.266E-12							
Mercury(I) perchlorate	$\text{Hg}_2(\text{ClO}_4)_2$	282	325	407	455		499		541		580
Mercury(I) sulfate	Hg_2SO_4			0.04277							
Mercury(II) acetate	$\text{Hg}(\text{C}_2\text{H}_3\text{O}_2)_2$			25							
Mercury(II) benzoate	$\text{Hg}(\text{C}_7\text{H}_5\text{O}_2)_2 \cdot 2\text{O}$			1.1							
Mercury(II) bromate	$\text{Hg}(\text{BrO}_3)_2 \cdot 2\text{H}_2\text{O}$			0.08							

Mercury(II) bromide	HgBr ₂	0.3	0.4	0.56	0.66	0.91		1.68		2.77		4.9
Mercury(II) chlorate	Hg(ClO ₃) ₂			25								
Mercury(II) chloride	HgCl ₂	3.63	4.82	6.57	8.34	10.2		16.3		30		61.3
Mercury(II) cyanide	Hg(CN) ₂			9.3								
Mercury(II) iodate	Hg(IO ₃) ₂			0.002372								
Mercury(II) iodide	HgI ₂			0.006								
Mercury(II) oxalate	HgC ₂ O ₄			0.011								
Mercury(II) sulfide	HgS			2.943E-25								
Mercury(II) thiocyanate	Hg(SCN) ₂			0.063								

N

Substance	Formula	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°	100°C
Neodymium(III) acetate	Nd(C ₂ H ₃ O ₂) ₃ ·H ₂ O			26.2								
Neodymium(III) bromate	Nd(BrO ₃) ₃	43.9	59.2	75.6	95.2	116						
Neodymium(III) chloride	NdCl ₃		96.7	98	99.6	102		105				
Neodymium(III) molybdate	Nd ₂ (MoO ₄) ₃				0.0019							
Neodymium(III) nitrate	Nd(NO ₃) ₃	127	133	142	145	159		211				
Neodymium(III) selenate	Nd ₂ (SeO ₄) ₃	45.2	44.6	41.8	39.9	39.9		43.9		7	3.3	
Neodymium(III) sulfate	Nd ₂ (SO ₄) ₃	13	9.7	7.1	5.3	4.1		2.8		2.2	1.2	
Nickel(II) acetate	C ₄ H ₆ NiO ₄											
Nickel(II) bromate	Ni(BrO ₃) ₂ ·6H ₂ O			28								
Nickel(II) bromide	NiBr ₂	113	122	131	138	144		153		154		155
Nickel(II) carbonate	NiCO ₃			0.0009643								
Nickel(II) chlorate	Ni(ClO ₃) ₂	111	120	133	155	181		221		308		

Potassium hydrogen sulfate	KHSO_4	36.2		48.6	54.3	61		76.4		96.1		122
Potassium hydrogen tartrate	$\text{KHC}_4\text{H}_4\text{O}_6$			0.6								6,2
Potassium hydroxide	KOH	95.7	103	112	126	134		154				178
Potassium iodate	KIO_3	4.6	6.27	8.08	10.3	12.6	14	18.3		24.8		32.3
Potassium iodide	KI	128	136	144	153	162		176		192	198	206
Potassium nitrate	KNO_3	22.4	47	47	61.6	77	91	103.4	114.6	124.6	133	141
Potassium nitrite	KNO_2	279	292	306	320	329		348		376	390	410
Potassium oxalate	$\text{K}_2\text{C}_2\text{O}_4$	25.5	31.9	36.4	39.9	43.8		53.2		63.6	69.2	75.3
Potassium perchlorate	KClO_4	0.76	1.06	1.68	2.56	3.73		7.3		13.4	17.7	22.3
Potassium periodate	KIO_4	0.17	0.28	0.42	0.65	1		2.1		4.4	5.9	
Potassium permanganate	KMnO_4	2.83	4.31	6.34	9.03	12.6	16.9	22.1				
Potassium persulfate	$\text{K}_2\text{S}_2\text{O}_8$			4.7								
Potassium phosphate	K_3PO_4		81.5	92.3	108	133						
Potassium selenate	K_2SeO_4	107	109	111	113	115		119		121		122
Potassium sulfate	K_2SO_4	7.4	9.3	11.1	13	14.8		18.2		21.4	22.9	24.1
Potassium tetraphenylborate	$\text{KBC}_{24}\text{H}_{20}$			0.000018								
Potassium thiocyanate	KSCN	177	198	224	255	289		372		492	571	675
Potassium thiosulfate	$\text{K}_2\text{S}_2\text{O}_3$	96		155	175	205		238		293	312	
Potassium tungstate	K_2WO_4			51.5								
Praseodymium(III) acetate	$\text{Pr}(\text{C}_2\text{H}_3\text{O}_2)_3 \cdot \text{H}_2\text{O}$			32								
Praseodymium(III) bromate	$\text{Pr}(\text{BrO}_3)_3$	55.9	73	91.8	114	144						
Praseodymium(III) chloride	PrCl_3			104								
Praseodymium(III) molybdate	$\text{Pr}_2(\text{MoO}_4)_3$			0.0015								
Praseodymium(III) nitrate	$\text{Pr}(\text{NO}_3)_3$			112	162	178						
Praseodymium(III) sulfate	$\text{Pr}_2(\text{SO}_4)_3$	19.8	15.6	12.6	9.89	2.56		5.04		3.5	1.1	0.91

R

Substance	Formula	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°	100°C
Radium chloride	RaCl ₂			19.6								
Radium iodate	Ra(IO ₃) ₂			0.04								
Radium nitrate	Ra(NO ₃) ₂			12								
Radium sulfate	RaSO ₄			0.00021								
Raffinose	C ₁₈ H ₃₂ O ₁₆ ·5H ₂ O			14								
Rubidium acetate	RbC ₂ H ₃ O ₂					86						
Rubidium bromate	RbBrO ₃				3.6	5.1						
Rubidium bromide	RbBr	90	99	108	119	132		158				
Rubidium chlorate	RbClO ₃	2.1	3.1	5.4	8	11.6		22		38	49	63
Rubidium chloride	RbCl	77	84	91	98	104		115		127	133	143
Rubidium chromate	Rb ₂ CrO ₄	62	67.5	73.6	78.9	85.6		95.7				
Rubidium dichromate	Rb ₂ Cr ₂ O ₇			5.9	10	15.2		32.3				
Rubidium fluoride	RbF			300								
Rubidium fluorosilicate	Rb ₂ SiF ₆			0.157								
Rubidium formate	RbHCO ₂		443	554	614	694		900				
Rubidium hydrogen carbonate	RbHCO ₃			110								
Rubidium hydroxide	RbOH			180								
Rubidium iodate	RbIO ₃			1.96								
Rubidium iodide	RbI			144								
Rubidium nitrate	RbNO ₃	19.5	33	52.9	81.2	117		200		310	374	452
Rubidium perchlorate	RbClO ₄	1.09	1.19	1.55	2.2	3.26		6.27		11	15.5	22
Rubidium periodate	RbIO ₄			0.648								
Rubidium selenate	Rb ₂ SeO ₄			159								
Rubidium sulfate	Rb ₂ SO ₄	37.5	42.6	48.1	53.6	58.5		67.5		75.1	78.6	81.8

S

Silver sulfate	Ag_2SO_4	0.57	0.7	0.8	0.89	0.98		1.15		1.3	1.36	1.41
Silver vanadate	AgVO_3			0.01462								
Sodium acetate	CH_3COONa	36.2	40.8	46.4	54.6	65.6		139		153	161	170
Sodium azide	NaN_3	38.9	39.9	40.8								
Sodium benzoate	$\text{NaC}_7\text{H}_5\text{O}_2$			66								
Sodium bromate	NaBrO_3	24.2	30.3	36.4	42.6	48.8		62.6		75.7		90.8
Sodium bromide	NaBr	80.2	85.2	90.8	98.4	107		118		120	121	121
Sodium carbonate	Na_2CO_3	7	12.5	21.5	39.7	49		46		43.9	43.9	
Sodium chlorate	NaClO_3	79.6	87.6	95.9	105	115		137		167	184	204
Sodium chloride	NaCl	35.65	35.72	35.89	36.09	36.37	36.69	37.04	37.46	37.93	38.47	38.99
Sodium chromate	Na_2CrO_4	31.7	50.1	84	88	96		115		125		126
Sodium cyanide	NaCN	40.8	48.1	58.7	71.2	dec						
Sodium dichromate	$\text{Na}_2\text{Cr}_2\text{O}_7$	163	172	183	198	215		269		376	405	415
Monosodium phosphate	NaH_2PO_4	56.5	69.8	86.9	107	133		172		211	234	
Sodium fluoride	NaF	3.66		4.06	4.22	4.4		4.68		4.89		5.08
Sodium formate	HCOONa	43.9	62.5	81.2	102	108		122		138	147	160
Sodium hydrogen carbonate	NaHCO_3	7	8.1	9.6	11.1	12.7		16				
Sodium hydroxide	NaOH		98	109	119	129		174				
Sodium iodate	NaIO_3	2.48	4.59	8.08	10.7	13.3		19.8		26.6	29.5	33
Sodium iodide	NaI	159	167	178	191	205		257		295		302
Sodium molybdate	Na_2MoO_4	44.1	64.7	65.3	66.9	68.6		71.8				
Sodium nitrate	NaNO_3	73	80.8	87.6	94.9	102		122		148		180
Sodium nitrite	NaNO_2	71.2	75.1	80.8	87.6	94.9		111		133		160

Thorium(IV) nitrate	$\text{Th}(\text{NO}_3)_4$	186	187	191								
Thorium(IV) selenate	$\text{Th}(\text{SeO}_4)_2 \cdot 9\text{H}_2\text{O}$	0.65										
Thorium(IV) sulfate	$\text{Th}(\text{SO}_4)_2 \cdot 9\text{H}_2\text{O}$	0.74	0.99	1.38	1.99	3						
Tin(II) bromide	SnBr_2	85										
Tin(II) chloride	SnCl_2	84										
Tin(II) fluoride	SnF_2			30								
Tin(II) iodide	SnI_2			0.99	1.17	1.42		2.11		3.04	3.58	4.2
Tin(II) sulfate	SnSO_4			18.9								
Trehalose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$			68.9								

U

Substance	Formula	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°	100°C
Uranyl acetate	$\text{UO}_2(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$			7.69								
Uranyl chloride	UO_2Cl_2			320								
Uranyl formate	$\text{UO}_2(\text{HCO}_2)_2 \cdot \text{H}_2\text{O}$			7.2								
Uranyl iodate	$\text{UO}_2(\text{IO}_3)_2 \cdot \text{H}_2\text{O}$			0.124								
Uranyl nitrate	$\text{UO}_2(\text{NO}_3)_2$	98	107	122	141	167		317		388	426	474
Uranyl oxalate	$\text{UO}_2\text{C}_2\text{O}_4$		0.45	0.5	0.61	0.8		1.22		1.94		3.16
Uranyl sulfate	$\text{UO}_2\text{SO}_4 \cdot 3\text{H}_2\text{O}$			21								
Urea	$\text{CO}(\text{NH}_2)_2$			108		167		251		400		733

V

Substance	Formula	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°	100°C
Vanadium(V) oxide	V_2O_5			0.8								

X

Substance	Formula	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°	100°C
Xenon	Xe			24								
Xylose	$\text{C}_5\text{H}_{10}\text{O}_5$			117								

Y

External links

- Solubility Database ^[1] - International Union of Pure and Applied Chemistry / National Institute of Standards and Technology

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